

U.S. Department of Energy  
**Office of River Protection**

P.O. Box 450  
Richland, Washington 99352

OCT 27 1999

99-PDD-085

The Honorable John T. Conway  
Chairman  
Defense Nuclear Facilities Safety Board  
625 Indiana Avenue, N.W., Suite 700  
Washington, D.C. 20004

Dear Mr. Chairman:

TRANSMITTAL OF THE DEFENSE NUCLEAR FACILITIES SAFETY BOARD (DNFSB)  
RECOMMENDATION 93-5 IMPLEMENTATION PLAN (IP) QUARTERLY REPORT FOR  
JULY 1999 THROUGH SEPTEMBER 1999

- References:
- (1) ORP letter from R. T. French to J. T. Conway, DNFSB, "Completion of the Defense Facilities Safety Board (DNFSB) Recommendation 93-5 Implementation Plan (IP), Revision 1, Milestone 5.4.3.6.d, 'Letter Reporting Completion of Topical Report to Resolve the High-Heat Safety Issue'," 99-TSD-088, dated September 24, 1999.
  - (2) ORP letter from R. T. French to J. T. Conway, DNFSB, "Defense Nuclear Facilities Safety Board (DNFSB) Recommendation 93-5 Implementation Plan (IP), Revision 1, Milestone 5.6.3.1j, 'Letter Reporting Completion of Core Sampling of all Tanks'," 99-PDD-052, dated July 08, 1999.

The Quarterly Report for July 1999 through September 1999 is attached. This Quarterly Report addresses issues and milestones as presented in Recommendation 93-5 IP, Revision 1.

Several significant technical achievements have been completed during this period. Core sampling for Tank 241-Z-361 was completed. Waste sluicing operations from Tank 241-C-106 to Tank 241-AY-102 have been completed. A total of 71 inches of sludge have been removed from Tank 241-C-106.

On July 8, 1999, Reference (1) was submitted to provide the basis for proposing closure of DNFSB Milestone 5.6.3.1j, "Letter Reporting Completion of Core Sampling of all Tanks."

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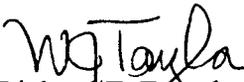
OCT 27 1999

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On September 24, 1999, Reference (2) was submitted to provide the technical basis for resolution of Tank 241-C-106 High-Heat Safety Issue and for proposing closure of DNFSB Milestone 5.4.3.6d, "Letter Reporting Completion of Topical Report to Resolve the High-Heat Safety Issue." As of today, all deliverables in 93-5 IP, Revision 1, have been submitted.

Sincerely,

  
for Richard T. French, Manager  
Office of River Protection

PDD:WSL

Attachment

cc w/attach:

C. L. Huntoon, EM-1  
C. A. Peabody, EM-4  
M. W. Frei, EM-30  
R. E. Lightner, EM-38  
T. R. Pauly, LMHC (w/o attach)  
M. A. Payne, LMHC (w/o attach)  
M. B. Whitaker, S-3.1  
A. K. Wright, ESD

**DNFSB 93-5 QUARTERLY REPORT, JULY 1 TO SEPTEMBER 30, 1999**

**EXECUTIVE SUMMARY**

The highlights for this quarter were continued sluicing of sludge from Tank 241-C-106, completion of construction activities in SY farm in preparation for the transfer of waste out of Tank 241-SY-101, completion of Tank 241-Z-361 core sampling, and submittal of a report that establishes a technical basis for proposing closure of the 93-5 milestone to core sample all tanks. The current issues discussed are the status of the Tank 241-C-106 sluicing and the milestone related to the High Heat Safety Issue, and the remediation program for Tank 241-SY-101 level rise. All deliverables in Revision 1 of the Implementation Plan have been submitted.

**DNFSB 93-5 QUARTERLY REPORT, JULY 1 TO SEPTEMBER 30, 1999**

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**DNFSB 93-5 QUARTERLY REPORT, JULY 1 TO SEPTEMBER 30, 1999**

**1. PURPOSE**

This quarterly report covers High Level Waste Tank Characterization activities at the Hanford Site related to the Defense Nuclear Facilities Safety Board (DNFSB) Recommendation 93-5 during the period July 1 to September 30, 1999. The Recommendation dealt with insufficient technical information to ensure safe storage, operation, retrieval, and disposal of the Hanford high-level tank wastes in both single and double-shell tanks. An Implementation Plan (IP) responding to Recommendation 93-5 was transmitted to the DNFSB by the Secretary of Energy in January 1994. The plan was accepted by the DNFSB on March 25, 1994. On June 17, 1996, Revision 1, to the IP was submitted to the DNFSB. Revision 1 was accepted by the DNFSB on September 4, 1996, with comments.

**2. QUARTERLY HIGHLIGHTS**

**2.1. Milestone(s) Submitted**

- 2.2.1. 5.4.3.6d, "Letter reporting completion of topical report to resolve the High Heat Safety Issue," forwarded on September 24, 1999.
- 2.2.2. 5.6.3.1j, "Letter reporting completion of core sampling of all tanks (assumes no repeat sampling)," forwarded on July 8, 1999.

**2.2. Waste Sample Shipments to BNFL**

No sample shipments to BNFL Inc. (BNFL) were planned for this quarter. The next shipment is planned for January 2000 from Tank 241-AN-104. Planning has started for the return of testing residues from BNFL to Hanford for disposal, which is expected to begin in October 1999.

**2.3. Tank Samples**

Samples accomplished this quarter were seven core samples, nine grab samples, and the monthly vapor grab samples at the Standard Hydrogen Monitoring System (SHMS) cabinets.

**DNFSB 93-5 QUARTERLY REPORT, JULY 1 TO SEPTEMBER 30, 1999****2.4. Tank 241-Z-361 Activities**

The water discovered in the aluminum pipes located in the risers was pumped out of the pipes and into the tank. Two core samples were obtained from Tank Z-361, and delivered to the 222-S Laboratory during September 1999.

**2.5. Milestone 5.6.3.1j Core Sample All Tanks**

A report (HNF-4232, Rev. 0, "Technical Basis for the Determination That Current Characterization Data and Processes Are Sufficient to Ensure Safe Storage and to Design Waste Disposal Facilities") was transmitted to the DNFSB by ORP on July 8, 1999. This report establishes a technical basis for determining that the current characterization data and processes are sufficient to ensure safe storage, that operations can be conducted safely, to design waste disposal facilities. This report provided the basis for proposing closure of DNFSB Milestone 5.6.3.1j, "Letter Reporting Completion of Core Sample All Tanks."

**DNFSB 93-5 QUARTERLY REPORT, JULY 1 TO SEPTEMBER 30, 1999**

**3. CURRENT ISSUES**

**3.1. High Heat Safety Issue Milestone**

Waste sluicing operations from Tank 241-C-106 to Tank 241-AY-102, initiated in November 1998, were continued in the fourth quarter. Sluicing Campaign 3 was conducted in multiple intervals beginning July 21, 1999. As of September 30, 1999, the total sludge removed from Tank 241-C-106 was approximately 68-69 inches out of a total of 71 inches in the tank. Sluicing Campaign 3 has been completed as of October 6, 1999.

On September 24, 1999, a topical report was submitted to the DNFSB that provides the technical basis for resolution of the Tank 241-C-106 High Heat Safety Issue. This report demonstrates that sufficient waste had been removed from Tank 241-C-106 as of August 30, 1999 (approximately 55 inches), to reduce the heat generation rate to a level that is safely dissipated by the ventilation system without regular water additions.

**3.2. Tank 241-SY-101 Level Rise**

Construction activities were completed in SY farm in preparation for the transfer of waste from Tank 241-SY-101 to 241-SY 102. Construction activities completed during the fourth quarter of FY 1999, included installation of the Prefabricated Pump Pit, Transfer Pump, transfer Lines, Water Skid, and Electrical Instrumentation/ Controls.

A meeting with the Tank Advisory Panel (TAP) was held in Richland, WA on September 13 and 14, 1999 to discuss the transfer and back dilution strategies. Informal verbal feedback at the conclusion of the meeting was favorable. A meeting with the Worker Health and Safety Sub-TAP is planned for October 1999.

**DNFSB 93-5 QUARTERLY REPORT, JULY 1 TO SEPTEMBER 30, 1999****4. STATUS OF REVISION 1 MILESTONES OVERDUE, DUE WITHIN SIX MONTHS, OR COMPLETED DURING THE REPORTING QUARTER****4.1. Safe Storage of Tank Wastes and Safe Operation of Tank Farms**Commitment**5.4.3.6 High Heat**

Statement: Retrieve wastes from Tank 241-C-106

Responsible Manager: Assistant Manager, AMSR

Applicable facilities and programs: ORP

Milestone deliverables/due dates:

- d. Letter reporting completion of topical report to resolve the High Heat Safety Issue.

Due Date: May 1998

Status: Complete. Letter 99-TSD-088 was submitted to the DNFSB on September 24, 1999, transmitting the High Heat Topical Report, HNF-3460, Revision 0-A.

**5.6.3.1 Complete Tank Waste Characterization Basis Sampling and Analysis**

Statement: Complete the sampling and analysis specified by the Tank Waste Characterization Basis (Approximately 28 tanks) to provide the highest priority information requested by the programmatic DQOs

Responsible Manager: Assistant Manager, AMSR

Applicable facilities and programs: ORP

Milestone deliverables/due dates:

- j. Letter reporting completion of core sampling of all tanks (assumes no repeat sampling)

Due Date: December 2002

Status: Complete. Letter 99-PDD-052 was submitted to the DNFSB on July 8, 1999, transmitting a report that establishes a technical bases for determining that the current characterization data and processes are sufficient to ensure safe storage, that operations can be conducted safely, to design waste disposal facilities. This report provided the basis for proposing closure of Milestone 5.6.3.1j.

**DNFSB 93-5 QUARTERLY REPORT, JULY 1 TO SEPTEMBER 30, 1999**

**5. APPENDICES**

**5.1. Tanks Sampled during Fourth Quarter FY 1999 (July through September 1999)**

Sample	Actual Start	Actual Finish
241-AZ-102 Push Samples 2 Segments 17	6/15/99	9/22/99
241-AZ-102 Push Samples 1 Segments 3	9/23/99	9/28/99
241-AW-103 Push Samples 2 Segments 10	8/24/99	9/8/99
241-Z-361 Push Samples 2 Segments 5	9/9/99	9/28/99
241-U-105 Grab Sample Compatibility (SW)	6/30/99	7/6/99
241-AW-104 Grab Sample Compatibility	7/13/99	7/13/99
241-S-109 Grab Sample Compatibility (SW)	7/28/99	7/28/99
241-S-111 Grab Sample Compatibility (SW)	8/3/99	8/3/99
241-AY-102 Grab Sample 241-C-106 Retrieval	8/26/99	8/26/99
241-AP-103 Grab Sample Compatibility	8/12/99	8/12/99
241-AP-107 Grab Sample Compatibility-Evaporator	8/30/99	8/30/99
241-SY-102 Grab Sample Compatibility	9/9/99	9/9/99
241-AP-108 Grab Sample Compatibility	9/21/99	9/21/99
Vapor SHMS Samples – Jul	7/19/99	7/26/99
Vapor SHMS Samples – Aug	8/27/99	8/31/99
Vapor SHMS Samples – Sep	9/10/99	9/27/99

**5.2. Sampling Schedule for First Quarter FY 2000 (October through December 1999)**

Sample	Early Start	Early Finish
241-AZ-101 Push Samples 2 Segments 18	10/1/99	11/3/99
241-AY-102 Push Samples 2 Segments 12	11/19/99	1/5/00
241-AY-102 Grab Sample 241-C-106 Retrieval	10/13/99	10/13/99
241-SY-102 Grab Sample Compatibility	12/15/99	12/17/99
241-102-AY Vapor SHMS (241-C-106 Retrieval)	10/20/99	10/20/99
241-AZ-101 Vapor Sample (Airlift Circulator Test)	11/1/99	11/2/99
ER-311 Catch Tank Sniff	11/1/99	11/1/99
241-AZ-102 Vapor Sample (Airlift Circulator Test)	11/8/99	11/9/99
S-304 Catch Tank Sniff	11/9/99	11/9/99
U-301B Catch Tank Sniff	11/17/99	11/17/99
UX-302A Catch Tank Sniff	11/30/99	11/30/99
EW-151 Catch Tank Sniff	12/9/99	12/9/99

## DNFSB 93-5 QUARTERLY REPORT, JULY 1 TO SEPTEMBER 30, 1999

## 5.3. Tank Sampling and Analysis Plans Issued During the Quarter

Tank	Number	Rev	Date
241-AZ-101	HNF-4738 (Tank 241-AZ-101 Privatization Push Mode Core Sampling and Analysis Plan)	0	7/28/99
241-Z-361	HNF-4371 (241-Z-361 Sludge Characterization Sampling and Analysis Plan)	1	8/05/99
241-AY-102	HNF-2958 (Tank 241-AY-102 Grab Sampling and Analysis Plan for Waste Retrieval Sluicing System Process Control)	O-D	8/18/99
241-AP-107	HNF-4839 (Sampling and Analysis Plan for Tank 241-AP-107 Waste in Support of Evaporator Campaign 2000-1)	O-A	8/26/99
241-AW-103	HNF-5071 (Tank 241-AW-103 Privatization Push Mode Core Sampling and Analysis Plan)	O	8/26/99
Various	HNF-3528 (Compatibility Grab Sampling and Analysis Plan for Fiscal Year 1999)	0-F	9/02/99
241-AZ-102	HNF-4577 (Tank 241-AZ-102 Privatization Push Mode Core Sampling and Analysis Plan)	3-A	9/20/99

## 5.4. Tank Characterization Reports Issued During the Quarter

Tank	Number	Rev	Date
241-AN-102	HNF-SD-WM-ER-545	2	7/12/99
241-AN-103	N/A (Electronic Report)	N/A	8/25/99
241-AN-104	N/A (Electronic Report)	N/A	9/08/99
241-AN-105	N/A (Electronic Report)	N/A	8/25/99
241-BY-105	N/A (Electronic Report)	N/A	9/14/99
241-S-110	N/A (Electronic Report)	N/A	8/25/99
241-SX-102	N/A (Electronic Report)	N/A	8/25/99
241-U-107	N/A (Electronic Report)	N/A	9/14/99

## DNFSB 93-5 QUARTERLY REPORT, JULY 1 TO SEPTEMBER 30, 1999

## 5.5. Laboratory Analysis Reports Issued During the Quarter

Tank	Title	Number	Date
241-AN-105	Revised Analytical Results for the Final Report -Tank 241-AN-105 Low Activity Waste Envelope A	WMH-9954970	7/19/99
241-TX-118	45-Day Safety Screening Results for Tank 241-TX-118	WMH-9955293	8/02/99
241-U-102	Tank 241-U-102 Grab Samples 2U-99-1, 2U-99-2 and 2U-99-3 Analytical Results for the Final Report	HNF-1674, Rev. 0	8/03/99
241-AN-104	Revised Analytical Results for the Final Report -Tank 241-AN-104 Low Activity Waste Envelope A	WMH-9858377 Reissue	8/26/99
241-TX-113	45-Day Safety Screening Results for Tank 241-TX-113	WMH-9955998	8/30/99
241-AW-101	Tank 241-AW-101 Low Activity Waste Envelope A Analytical Results for the Final Report	HNF-1652, Rev. 0A	8/31/99
241-AN-107	Tank 241-AN-107 Low Activity Waste Envelope C Analytical Results for the Final Report	HNF-1653, Rev. 0A	8/31/99
241-TX-118	90-Day Safety Screening Results for Tank 241-TX-118	WMH-9956062	9/02/99
241-U-105	Tank 241-U-105 Grab Samples 5U-99-1, 5U-99-2 and 5U-99-3 Analytical Results for the Final Report	HNF-1676, Rev. 0	9/15/99
241-AW-104	Tank 241-AW-104 July 1999 Compatibility Grab Samples, Analytical Results for the Final Report	HNF-1677, Rev. 0	9/28/99
241-SY-101	Tank 241-SY-101 Cores 255, 256 and 257, Analytical Results for the Final Report	HNF-1666, Rev. 0	9/28/99

**DNFSB 93-5 QUARTERLY REPORT, JULY 1 TO SEPTEMBER 30, 1999**

**5.6. Table of DNFSB 93-5 Implementation Plan Revision 1 Commitments Status**

<b>Number</b>	<b>Description</b>	<b>Due Date</b>	<b>Reported to DNFSB</b>
5.4.3.1a	Comprehensive Source Terms Report	6/30/96	6/30/96
5.4.3.1b	Report on Lightning Evaluation	8/31/96	8/30/96
5.4.3.1c	Approved BIO	12/31/96	12/30/96
5.4.3.1d	Approved FSAR	6/30/97	4/6/99
5.4.3.2a	Topical Report on Resolution of Ferrocyanide Safety Issue	1/31/97	9/23/96
5.4.3.3a	Supporting Technical Document on Organic Complexant Safety Issue	12/31/96	6/27/97
5.4.3.3b	Confirm Safe Storage Criteria, and Organic Solubility and Aging Effects on Fuel Content	11/30/98	11/25/98
5.4.3.4a	Safety Assessment Covering Pool and Entrained Organic Solvent Fires	10/31/96	10/21/96
5.4.3.4b	Organic Speciation of Core Samples for 241-BY-108 and 241-BY-110, and Auger Samples for 241-C-102	10/31/96	10/31/96
5.4.3.4c	Supporting Technical Document for Organic Solvent Safety Issue	12/31/96	12/23/96
5.4.3.4d	Vapor Sampling of all SSTs	12/31/99	4/15/99
5.4.3.4e	Adequate Vent Path in All SSTs Suspected of Containing Organic Solvents	4/30/00	4/15/99
5.4.3.4f	Letter Reporting Completion of Vapor Sampling of All DSTs	12/31/00	4/15/99
5.4.3.5a	Analyses to Determine If Additional Tanks Have Potential to Exceed 25% of the LFL	6/30/96	6/28/96
5.4.3.5b	Gas Monitoring Instrumentation Upgrade Needs for Additional Tanks with the Potential to Exceed 25% of the LFL	8/31/96	8/19/96
5.4.3.5c	Safety Assessment for Rotary Mode Core Sampling in Flammable Gas Tanks	9/30/96	9/27/96
5.4.3.5d	Qualification of Rotary Mode Core Sampling System for Use in Flammable Gas Tanks	9/30/96	1/7/98
5.4.3.5e	Safety Assessment for Saltwell Pumping in Flammable Gas Tanks	10/31/96	10/31/96
5.4.3.5f	Letter Reporting Completion of AN Tank Farm Ventilation Upgrade	11/30/96	1/30/97
5.4.3.5g	Flammable Gas Safety Screening of Remaining Passively Ventilated SSTs	11/30/96	11/12/96
5.4.3.5h	Supporting Technical Document on Flammable Gas Safety Issue	12/31/96	1/30/97
5.4.3.5i	External Equipment Spark Sources in Flammable Gas Tanks	12/31/96	12/24/96
5.4.3.5j	Voidmeter and Viscometer Readings in Tanks 241-AN-103, 241-AN-104, and 241-AN-105	12/31/96	12/18/96
5.4.3.5k	Retained Gas Sampling in Tanks 241-AW-101, 241-AN-103, 241-AN-104, 241-AN-105, and 241-A-101	3/31/97	3/28/97
5.4.3.5l	Refinement of Flammable Gas Generation/Retention Models	5/31/97	5/27/97

## DNFSB 93-5 QUARTERLY REPORT, JULY 1 TO SEPTEMBER 30, 1999

Number	Description	Due Date	Reported to DNFSB
5.4.3.6a	241-C-106 Supernatant Sampling and Analysis	10/31/96	10/30/96
5.4.3.6b	241-C-106 Retrieval Safety Assessment	7/31/97	10/3/97
5.4.3.6c	Initiation of Tank 241-C-106 Waste Retrieval	10/31/97	11/25/98
5.4.3.6d	Topical Report to Resolve the High Heat Safety Issue	5/31/98	9/24/99
5.4.3.7a	Topical Report to Resolve the Criticality Safety Issue	12/31/96	12/18/96
5.5.6.1a	Completion of High Priority Tanks Sampling and Analysis for the Disposal Program	3/31/98	3/27/98
5.6.3.1a	Comparison Between Truck and Cart Vapor Sampling Systems	9/30/96	9/27/96
5.6.3.1b	Implementation of FTIR Moisture Analysis Capability in 222-S Laboratory	11/30/96	11/19/96
5.6.3.1c	Proposed Content and Format of Tank-by-Tank Safety Status Evaluation	1/31/97	1/30/97
5.6.3.1d	Updated HTCEs	6/30/97	6/6/97
5.6.3.1e	Verification of Headspace Homogeneity	10/31/97	10/22/97
5.6.3.1f	Standard Inventory Estimates for All Tanks	11/30/97	10/31/97
5.6.3.1g	Completion of High Priority Tanks Sampling and Analysis	3/31/98	3/27/98
5.6.3.1h	Tank-by-Tank Safety Status Evaluation	7/31/98	7/22/98
5.6.3.1i	Update Tank Content Models	12/31/98	12/28/98
5.6.3.1j	Completion of Core Sampling of All Tanks	12/31/02	7/8/99